

WHAT IS CLAIMED IS:

1. A resin composition for heat-shrinkable polypropylene shrink label, which comprises: from 50 to 95% by weight of a crystalline propylene- $\alpha$ -olefin random copolymer mainly comprising propylene, the copolymer satisfying the following requirements (1) to (3); and from 5 to 50% by weight of an alicyclic hydrocarbon resin having a softening temperature of not lower than 110°C:

Requirement (1): The copolymer exhibits a melt flow rate of from 0.5 to 10 g/10 min at a temperature of 230°C and a load of 2.16 kg;

Requirement (2): The copolymer exhibits a main fusion peak temperature ( $T_p$ ) of from 100°C to 140°C as determined by means of a differential scanning calorimeter (DSC); and

Requirement (3): The copolymer exhibits  $T_{50}$  of not higher than 125°C with the proviso that  $T_{50}$  is a temperature (°C) at which an amount of heat of fusion calculated from a lower temperature side is 50% of  $\Delta H_m$  supposing that  $\Delta H_m$  is the total amount of heat of fusion of the copolymer as determined by DSC.

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2. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 1, wherein in a dynamic viscoelasticity measurement, at least one peak of loss tangent ( $\tan \delta$ ) measured at a frequency of 1 Hz and a strain of 0.1% is observed at the range of from 30°C to 100°C, and a

peak value thereof is not smaller than 0.10.

3. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 1, wherein the  
5 crystalline propylene- $\alpha$ -olefin random copolymer is a propylene-ethylene random copolymer.

4. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 1, wherein the  
10 crystalline propylene- $\alpha$ -olefin random copolymer is a copolymer obtained by polymerization in the presence of a metallocene catalyst.

5. A resin composition for heat-shrinkable polypropylene shrink label, which comprises a crystalline polypropylene in  
15 an amount of not smaller than 50% by weight, wherein in a dynamic viscoelasticity measurement, at least one peak of loss tangent ( $\tan \delta$ ) measured at a frequency of 1 Hz and a strain of 0.1% is observed at the range of from 30°C to 100°C, and a peak value  
20 thereof is not smaller than 0.10.

6. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 5, wherein in a  
dynamic viscoelasticity measurement, at least one peak of loss  
25 tangent ( $\tan \delta$ ) measured at a frequency of 1 Hz and a strain

of 0.1% is observed at the range of from 30°C to 100°C, and a peak value thereof is not smaller than 0.10.

7. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 5, wherein the crystalline propylene- $\alpha$ -olefin random copolymer is a propylene-ethylene random copolymer.

8. The resin composition for heat-shrinkable polypropylene shrink label according to Claim 5, wherein the crystalline propylene- $\alpha$ -olefin random copolymer is a copolymer obtained by polymerization in the presence of a metallocene catalyst.

9. A film for heat-shrinkable polypropylene shrink label comprising a resin composition according to Claim 1, which has been stretched at least monoaxially at a draw ratio of not smaller than 2.

10. A film for heat-shrinkable polypropylene shrink label comprising a resin composition according to Claim 5, which has been stretched at least monoaxially at a draw ratio of not smaller than 2.

11. A laminated film for shrink label, which comprises

as an interlayer (I) a layer comprising a resin composition according to Claim 1, wherein the sum number of the interlayer (I) and a surface layer (II) is not smaller than 2.

5           12. A laminated film for shrink label, which comprises as an interlayer (I) a layer comprising a resin composition according to Claim 5, wherein the sum of the interlayer (I) and surface layer (II) is not smaller than 2.

10           13. A laminated film for shrink label, which comprises: an interlayer (I) comprising a resin composition according to Claim 1; and a surface layer (II) laminated on at least one side of the interlayer (I), the laminated film having been stretched at least monoaxially at a draw ratio of not smaller than 2,

15           wherein the surface layer (II) laminated on at least one side of the interlayer (I) has a total thickness of 1 to 50% of the total film thickness, and the surface layer (II) comprises a resin composition comprising a crystalline propylene- $\alpha$ -olefin random copolymer (2) mainly comprising a propylene, the  
20           crystalline propylene- $\alpha$ -olefin random copolymer (2) satisfying the following requirements (d) and (e):

          Requirement (d): The resin composition exhibits a melt flow rate of from 0.5 to 50 g/10 min at a temperature of 230°C and a load of 2.16 kg; and

25           Requirement (e): The resin composition exhibits a main

fusion peak temperature (Tp) of from 100°C to 150°C as determined by means of a differential scanning calorimeter (DSC).

14. A laminated film for shrink label, which comprises:  
5 an interlayer (I) comprising a resin composition according to Claim 5; and a surface layer (II) laminated on at least one side of the interlayer (I), the laminated film having been stretched at least monoaxially at a draw ratio of not smaller than 2,

wherein the surface layer (II) laminated on at least one  
10 side of the interlayer (I) has a total thickness of 1 to 50% of the total film thickness, and the surface layer (II) comprises a resin composition comprising a crystalline propylene- $\alpha$ -olefin random copolymer (2) mainly comprising a propylene, the crystalline propylene- $\alpha$ -olefin random copolymer (2) satisfying  
15 the following requirements (d) and (e):

Requirement (d): The resin composition exhibits a melt flow rate of from 0.5 to 50 g/10 min at a temperature of 230°C and a load of 2.16 kg; and

Requirement (e): The resin composition exhibits a main  
20 fusion peak temperature (Tp) of from 100°C to 150°C as determined by means of a differential scanning calorimeter (DSC).

15. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 13, wherein the surface layer  
25 (II) comprises a resin composition comprising an anti-blocking

agent having a volume-average particle diameter of from 1.0 to 10  $\mu\text{m}$  in an amount of from 0.05 to 1.0 parts by weight based on 100 parts by weight of the crystalline propylene- $\alpha$ -olefin random copolymer (2).

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16. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 14, wherein the surface layer (II) comprises a resin composition comprising an anti-blocking agent having a volume-average particle diameter of from 1.0 to 10  $\mu\text{m}$  in an amount of from 0.05 to 1.0 parts by weight based on 100 parts by weight of the crystalline propylene- $\alpha$ -olefin random copolymer (2).

17. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 13, wherein the crystalline propylene- $\alpha$ -olefin random copolymer (2) in the surface layer is a propylene-ethylene random copolymer.

18. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 14, wherein the crystalline propylene- $\alpha$ -olefin random copolymer (2) in the surface layer is a propylene-ethylene random copolymer.

19. The film for shrink label according to Claim 9, which shrinks in the main shrinking direction at a shrinkage rate

satisfying the following relationships (1) to (3), exhibits a specific gravity of not greater than 0.95, and shrinks at a shrinkage rate of less than 3% at a temperature of 40°C in 7 days:

5 Relationship (1):  $S_{80} > 251d - 215$

Relationship (2):  $S_{90} > 531d - 462$

Relationship (3):  $S_{100} > 627d - 541$

wherein  $S_{80}$ ,  $S_{90}$  and  $S_{100}$  are shrinkage rates (%) in the main shrinking direction determined when dipped in a hot water bath at 80°C, 90°C and 100°C, respectively, for 10 seconds; and d is the specific gravity of the film for shrink label.

20. The film for shrink label according to Claim 10, which shrinks in the main shrinking direction at a shrinkage rate satisfying the following relationships (1) to (3), exhibits a specific gravity of not greater than 0.95, and shrinks at a shrinkage rate of less than 3% at a temperature of 40°C in 7 days:

Relationship (1):  $S_{80} > 251d - 215$

20 Relationship (2):  $S_{90} > 531d - 462$

Relationship (3):  $S_{100} > 627d - 541$

wherein  $S_{80}$ ,  $S_{90}$  and  $S_{100}$  are shrinkage rates in the main shrinking direction determined when dipped in a hot water bath at 80°C, 90°C and 100°C, respectively, for 10 seconds; and d is the specific gravity of the film for shrink label.

21. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 11, which shrinks in the main shrinking direction at a shrinkage rate satisfying the following relationships (1) to (3), exhibits a specific gravity of not greater than 0.94, and shrinks at a shrinkage rate of less than 3% at a temperature of 40°C in 7 days:

Relationship (1):  $S_{80} > 251d - 215$

Relationship (2):  $S_{90} > 531d - 462$

Relationship (3):  $S_{100} > 627d - 541$

wherein  $S_{80}$ ,  $S_{90}$  and  $S_{100}$  are shrinkage rates (%) in the main shrinking direction determined when dipped in a hot water bath at 80°C, 90°C and 100°C, respectively, for 10 seconds; and d is the specific gravity of the laminated film for shrink label.

22. The laminated film for heat-shrinkable polypropylene shrink label according to Claim 12, which shrinks in the main shrinking direction at a shrinkage rate satisfying the following relationships (1) to (3), exhibits a specific gravity of not greater than 0.94, and shrinks at a shrinkage rate of less than 3% at a temperature of 40°C in 7 days:

Relationship (1):  $S_{80} > 251d - 215$

Relationship (2):  $S_{90} > 531d - 462$

Relationship (3):  $S_{100} > 627d - 541$

wherein  $S_{80}$ ,  $S_{90}$  and  $S_{100}$  are shrinkage rates (%) in the main shrinking direction determined when dipped in a hot water bath



at 80°C, 90°C and 100°C, respectively, for 10 seconds; and d is the specific gravity of the laminated film for shrink label.

23. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a film for shrink label according to Claim 9.

24. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a film for shrink label according to Claim 10.

25. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a film for shrink label according to Claim 19.

26. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a film for shrink label according to Claim 20.

27. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a laminated film for shrink label according to Claim 11.

28. A heat-shrinkable label having a specific gravity of less than 1.0, which comprises a laminated film for shrink

label according to Claim 12.

29. A heat-shrinkable label having a specific gravity  
of less than 1.0, which comprises a laminated film for shrink  
5 label according to Claim 13.

30. A heat-shrinkable label having a specific gravity  
of less than 1.0, which comprises a laminated film for shrink  
label according to Claim 14.

31. A container having a heat-shrinkable label according  
to Claim 23 attached thereto.

32. A container having a heat-shrinkable label according  
15 to Claim 24 attached thereto.

33. A container having a heat-shrinkable label according  
to Claim 27 attached thereto.

34. A container having a heat-shrinkable label according  
20 to Claim 28 attached thereto.

35. A container having a heat-shrinkable label according  
to Claim 29 attached thereto.

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36. A container having a heat-shrinkable label according to Claim 30 attached thereto.

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